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COUNCIL
ON
COMPETITIVENESS

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COMPETITIVENESS INDEX 1993

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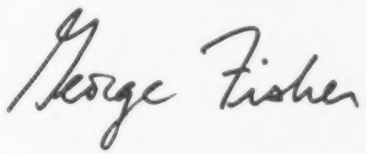
The price is $10 plus $1 postage and handling (domestic) and $3.50 (overseas).

PREFACE

The Council on Competitiveness is pleased to release its sixth annual *Competitiveness Index*.

In reviewing this year's *Index*, the effects of the recession on the global economy, particularly on living standards and investment, are apparent. Stimulating economic growth has been a primary theme in this country and other industrialized countries for the past year, and it will no doubt be a central issue as the G-7 nations meet in Tokyo this July for the Economic Summit. Economic growth affects everything we as a nation can commit to do — from investing in the education and training of our people to bringing new technologies to market. It also affects what we can do as a superpower to help other countries achieve economic and political stability.

The *Competitiveness Index* brings to you both long-term trends and latest year developments in investment, manufacturing productivity, exports and standard of living, comparing U.S. performance in each of these areas with those of our chief economic competitors in the G-7 and with America's own past performance. We hope that this year's *Index* will be useful to government policymakers, private sector leaders, the press, and American citizens as they work to come up with pro-competitive policies for this country in the year to come.



George M.C. Fisher
Chairman
Council on Competitiveness
Chairman and Chief Executive Officer
Motorola, Inc.

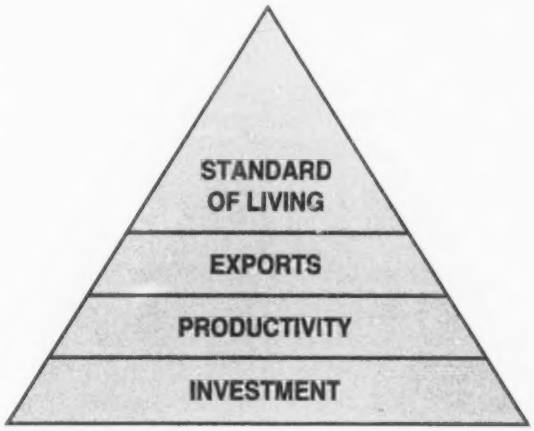
JUNE 1993

INTRODUCTION

Since 1987, the Council on Competitiveness has provided Americans with an annual assessment of U.S. economic competitiveness via the *Competitiveness Index*. The *Index* measures U.S. competitiveness in two basic ways: relative to past U.S. performance and relative to a group of advanced industrialized nations known as the Group of 7 (or G-7), which in addition to the United States includes Canada, France, Germany[1], Italy, Japan, and the United Kingdom.

THE PYRAMID

The *Competitiveness Index* assesses U.S. economic competitiveness by examining four economic indicators: investment, manufacturing productivity, exports, and standard of living. The linkages among these indicators can best be understood by looking at the pyramid below:



INVESTMENT is a fundamental building block of current and future economic activity and is therefore at the base of our pyramid. How much a nation invests will ultimately affect the other three measures of competitiveness. The *Index* defines investment to include both "hard" assets, such as private sector expenditure on factories and equipment, as well as "soft" assets, such as nondefense spending on R&D and public sector expenditure on education. Investment is measured as a share of Gross Domestic Product (GDP).

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[1] Official German economic statistics are still in the process of being adjusted to account for a united Germany. Because of various problems associated with standardizing historical data for the two Germanies, the Council has made a decision to continue to use west German statistics for all *Index* data that is derived from national income accounts (i.e., standard of living, productivity, and investment), but to use united Germany trade data (from 1991 onward) for the *Index* section on exports, since Germany issues trade data for a united Germany.

MANUFACTURING PRODUCTIVITY is largely determined by the quality and performance of the workforce, technological innovation, the quality of plant and equipment, and the efficiency with which these factors of production are organized. We focus on manufacturing productivity because manufacturing accounts for about one-fifth of U.S. output and the bulk of U.S. trade. A strong and productive manufacturing base underlies the success of other sectors, such as services. The *Competitiveness Index* measures manufacturing productivity as GDP per employee (including self-employed) in the manufacturing sector.

EXPORTS are represented by the third tier of the pyramid. Although exchange rates affect the near-term competitiveness of exports, over the long term exports are directly influenced by the quality, price and availability of goods. Exports are a good indicator of a nation's ability to compete in world markets, and the production of competitive, tradeable goods is in turn dependent on high rates of productivity and adequate investment in new and better products and processes of production. The *Competitiveness Index* measures export performance as a country's share of world manufactured goods exports.

STANDARD OF LIVING crowns the competitiveness pyramid because it is the ultimate objective of a capitalist, free-market economy. A nation strives to be internationally competitive in the global marketplace in order to raise living standards for its citizens at home. The *Index* measures standard of living as GDP per capita.

UNDERSTANDING THIS REPORT

Tracking Growth in Real Terms

The *Competitiveness Index* compares U.S. growth in investment, productivity, exports, and standard of living with that in other G-7 countries.[2] The best way to track trends and eliminate distortions caused by year-to-year variations in inflation is to compare growth in real terms rather than actual nominal growth. We can track growth in real terms by using a fixed year exchange rate for a historical series of volume data.[3] The *Index* tracks real growth both for the most recent year (1991-1992, unless otherwise noted) and over the long term (from 1972 to 1992, unless otherwise noted).[4]

Using Other Measures

In addition to tracking growth in real terms, the *Competitiveness Index* provides several other ways of measuring performance for each of the four competitiveness indicators. Two alternate ways of assessing U.S. competitive performance include the use of current dollars and of Purchasing Power Parity (PPP) comparisons. Both of these measures yield additional information and a more complete picture for some of the competitiveness indicators.

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[2] Whenever the term "Other G-7" is noted, it is used to refer to an *average* for all the G-7 countries *excluding* the United States. Otherwise, comparisons are made on a country-by-country basis.

[3] The *Index* uses data that is calculated in 1985 prices and exchange rates (also known as "real 1985 dollars") for all the G-7 countries.

[4] The Council on Competitiveness uses 1972 as its base year because it was the year before flexible exchange rates were introduced and before oil shocks fundamentally changed the international economy.

Using current dollars is the most straightforward and simple way of presenting data; current dollar amounts are frequently cited in the press and are the figures with which most people are familiar. Except for exports, current dollar comparisons are less useful in measuring long-term growth, because of the possibility of wide annual price fluctuations. Exports in current dollars represent the amount of foreign exchange earnings and is the result of both export volume and value of each product. To be competitive, a nation needs to be able to export more volume in high value products. Therefore, in addition to measuring real export growth, we also measure export performance in current dollars.

The *Index* also provides some Purchasing Power Parity comparisons[5] for investment, productivity, and standard of living. PPPs are a shorthand way of expressing the buying power of foreign currencies in their home markets relative to the buying power of the U.S. dollar in America. We use the Organization for Economic Cooperation and Development's (OECD's) annually adjusted PPPs, which measure how much it costs to buy a standard basket of goods and services in different countries relative to how much the same basket costs in the United States. The PPP goods and services basket is periodically updated to account for changes in consumption patterns over time, with the latest basket of goods reflecting 1990 purchasing patterns.

It is important to realize that the OECD's PPPs can only be used to show differences in *current levels* of performance among countries. They *cannot* be used to make growth rate comparisons of real output over time, because PPP-converted data still contains an element of inflation, as well as changes in output quantity.

Data Sources

All of the data used in the *Index* comes from the OECD unless otherwise noted.[6] The WEFA Group provided technical assistance in the initial construction of the *Competitiveness Index* and in subsequent revisions.

[5] PPPs are nominal and reflect current prices.

[6] Data for civilian R&D comes from the National Science Foundation.

COMPETITIVENESS INDICATORS

HIGHLIGHTS OF FINDINGS

Standard of Living
After two consecutive years of decline, U.S. living standards rose by just over 1 percent in 1992. Despite this good news, living standards in 1992 were still below the level in 1989, prior to the recession. Furthermore, over the past 20 years, U.S. living standards have grown more slowly than those of any other G-7 country.

Exports
U.S. export volumes rose briskly in 1992, comparing favorably with the best performers in the G-7. Since 1972, U.S. exports have grown more rapidly than any other G-7 country except Japan. Still, from 1991 to 1992, the U.S. share of world exports in manufactured goods remained unchanged at about 12.4 percent, a level that is lower than the 12.5 percent share achieved in 1989. Overall, the United States continues to export less than 6 percent of its GDP, which is less than any other G-7 country.

Manufacturing Productivity
U.S. manufacturing productivity dipped slightly in the latest year for which data is available (1989), but overall U.S. manufacturing productivity has been holding its own over the past two decades compared with most of the other G-7 countries. Only Japan and Italy have had significantly stronger productivity growth.

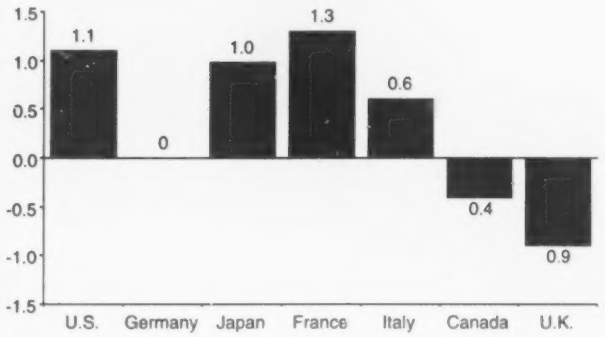
Investment in Plant & Equipment
In 1992, the United States was the only G-7 country in the recovery phase of the business cycle and all the other countries were either still in the midst of recession or heading toward recession. Therefore, only the United States was able to increase its level of investment in plant and equipment (by just under 3 percent) in 1992. Investment fell off in all other G-7 countries in 1992, both as a percent of GDP and in real dollar terms. Still, at 10.6 percent of GDP, the United States continues to invest relatively less in plant and equipment than any other G-7 country and at about half the level of Japan.

Investment in Civilian R&D
Real investment in civilian R&D rose a modest 2 percent from 1989 to 1990 in the United States. This is dwarfed by the 8.7 percent real increase experienced in Japan, but is slightly more than Germany's 1.5 percent increase. In relative terms, U.S. nondefense R&D has remained flat at 1.9 percent of GDP for much of the 1980s, while spending in Germany and especially Japan has increased significantly. Over the past two decades, Japan has increased real spending on civilian R&D by over 200 percent, whereas U.S. real spending grew by 87 percent over the same time frame.

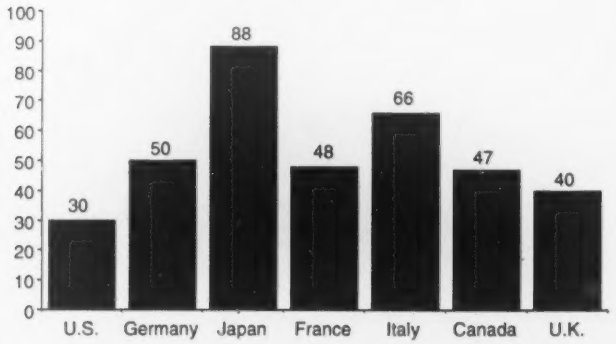
Investment in Education
The U.S. public sector invests relatively more in education than do most of its G-7 competitors. However, the returns on that investment continue to be the subject of much debate.

STANDARD OF LIVING

(1992)
Latest Year Percent of Growth
in Real Standard of Living



(1972–1992)
Long-Term Percent of Growth
in Real Standard of Living



- **U.S. rebounds in 1992.** 1992 proved to be a better year for the United States than for most of the other G-7 countries that were struggling through a global recession that had already hit the United States. The U.S. standard of living rose by a modest 1.1 percent in 1992, reversing last year's decline and giving the United States the strongest growth in living standards of all the G-7 countries except France.

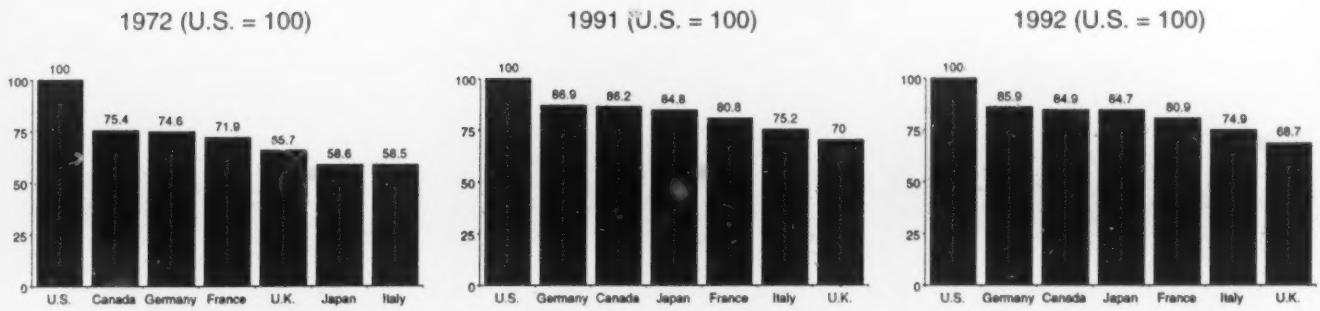
  The chart above (top left) also shows that the standard of living in Japan grew by about 1 percent in 1992. This marks a sharp contrast to the late 1980s, when Japanese living standards grew by well over 4 percent in some years. Real growth in 1992 was the weakest in Japan since the 1973-1974 global recession.

  The German standard of living remained virtually flat in 1992 and, for the second year in a row, living standards declined in both Britain and Canada. Italy experienced only modest growth.

- **But, U.S. long-term growth still slowest in G-7.** Despite the uptick in U.S. living standards in 1992, during the last 20 years they have grown much more slowly than living standards in the other G-7 countries. Since 1972, U.S living standards have risen only 30 percent in real terms versus 88 percent in Japan and 50 percent in Germany, two of America's strongest competitors. The chart above (top right) shows real long-term growth for all the G-7 countries.

STANDARD OF LIVING

Standard of Living
in Purchasing Power Parities



■ **Long-term convergence.** Using Purchasing Power Parities, which adjust for price differences in other countries relative to the United States, we can see from the above chart that the United States still enjoys a leading position in its living standard relative to the other G-7 countries. In 1992, U.S. PPP-adjusted living standards were still about 15 percent higher than the nearest challenger, Germany.

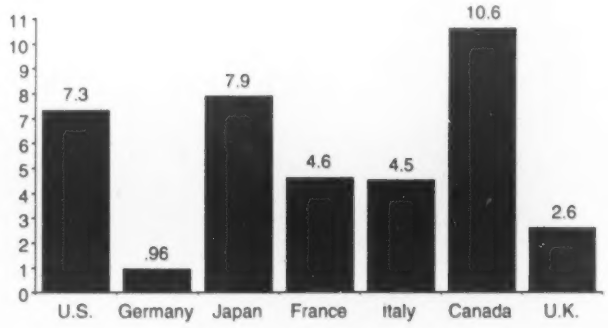
Although the global recession in 1992 temporarily reversed the trend of convergence in living standards between other industrialized countries and the United States, citizens of the other G-7 countries may continue to gain purchasing power relative to their American peers. The gap has been closing steadily over the past several decades.

The Japanese and Italians, in particular, have made the biggest gains over the past two decades, shrinking the difference in their purchasing power from about 41 percent in 1972 to 15 percent and 25 percent, respectively, in 1992.

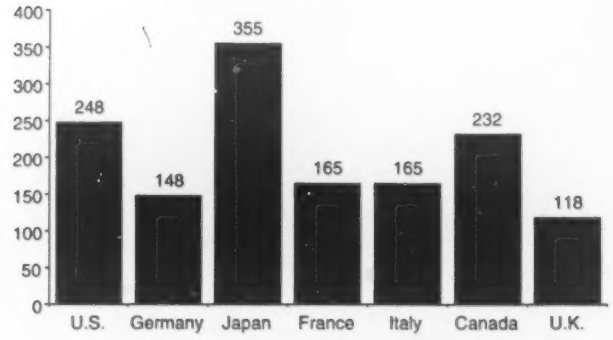
Standard of Living is defined and measured as Gross Domestic Product per capita.

EXPORTS

(1992)
Latest Year Percent of Growth
in Real Exports



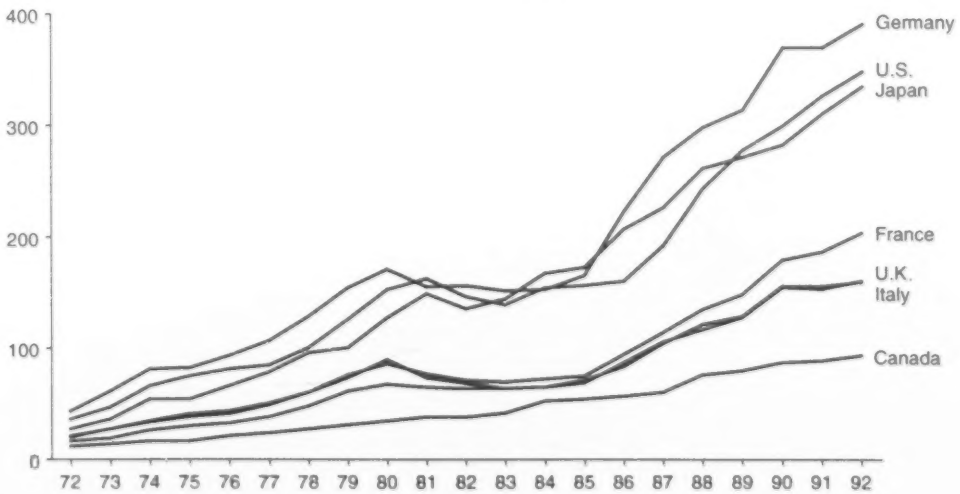
(1972–1992)
Long-Term Percent of Growth
in Real Exports



- **U.S. exports rise briskly.** In volume terms, exports grew by over 7 percent in the United States in 1992. As the chart above (top left) illustrates, only Canada and Japan fared better with 8 percent and 10.6 percent real growth, respectively. Germany had the weakest export performance in 1992, barely managing 1 percent growth; this weak performance was mainly due to the reunification.

- **But, U.S. stays in #2 spot.** Despite Germany's weak export growth in 1992, it still out-exported the United States by about $43 billion in total value, claiming just under 14 percent of world share. As the chart below shows, the United States exported $348 billion worth of goods in 1992, with 12.4 percent share of world exports. Japan remained the world's number three exporter by selling $334 billion worth of goods overseas; Japan's share of world exports came to just under 12 percent.

Manufactured Goods Exports
(1972–1992)
(in current dollars)

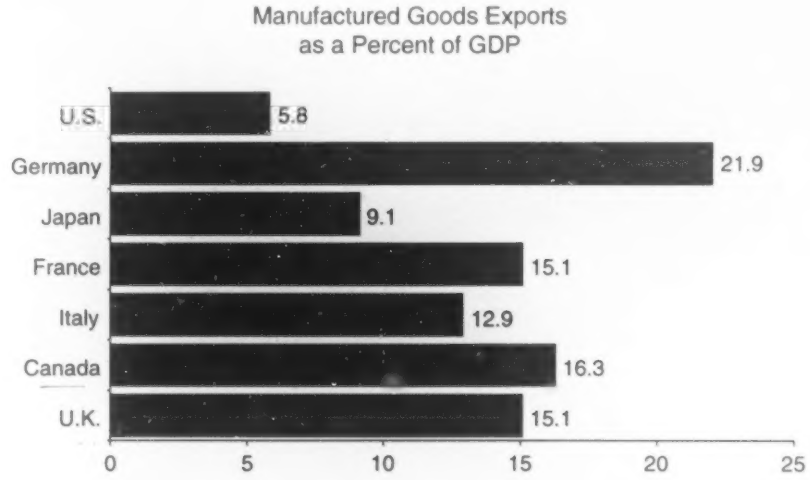


EXPORTS

- **Japan leads export growth since 1972; U.S. comes in second.** The top right chart on the previous page shows that exports in Japan have grown by 355 percent in volume terms since 1972. Over the same period, U.S. manufactured goods exports grew by 248 percent, slightly more than Canada's 232 percent and more than double the weakest G-7 performer, Britain. Despite having been the world's top volume exporter for a good part of the past two decades, Germany's exports have grown by only 150 percent over this time.

  The late 1980s were good export years for America. Since 1986, partly due to a depreciation in the dollar, U.S. exports have grown by almost 100 percent in real terms. This is more than twice the rate of the next best competitor, Japan, whose exports grew about 42 percent since 1986.

- **Untapping U.S. export potential.** For all the good news on export volume, U.S. industry overall exports less than any of its G-7 competitors, when manufactured goods exports are measured as a share of GDP. Exporting just under 6 percent of its GDP, the United States' export effort is about half that of some of its G-7 competitors. Germany — which sells over a fifth of its goods abroad — exports almost four times its relative share of GDP than the United States. See the chart below for other comparisons. Perhaps surprisingly, Japan exports only about 9 percent of its GDP.

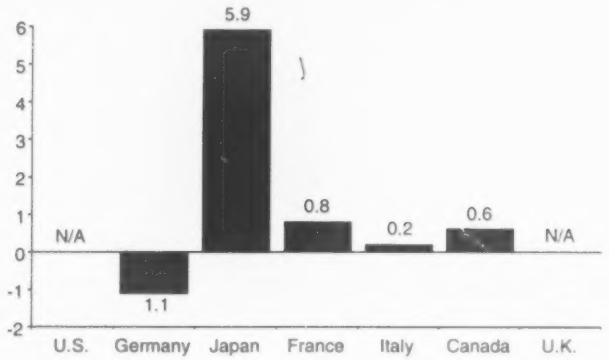


- **No good news on import side.** Even with strong export growth over the past several years, the United States continues to be the world's largest importer and again recorded large trade and current account deficits in 1992. For manufacturing goods, America still consumes more than it produces.

Export performance is measured by determining world share of manufactured goods exports.

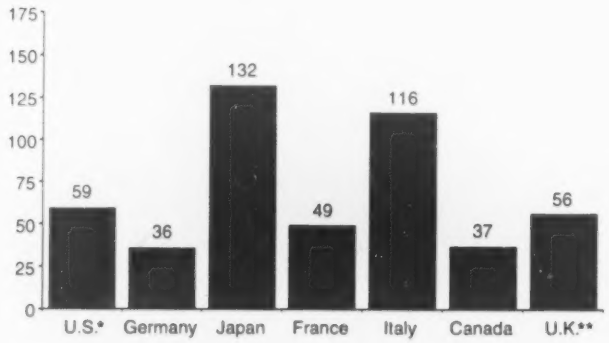
MANUFACTURING PRODUCTIVITY

(1990)
Latest Year Percent of Growth
in Real Manufacturing Productivity



N/A = not available

(1972–1990)
Long-Term Percent of Growth
in Real Manufacturing Productivity



*U.S. = 1989, latest year
**U.K. = 1987, latest year

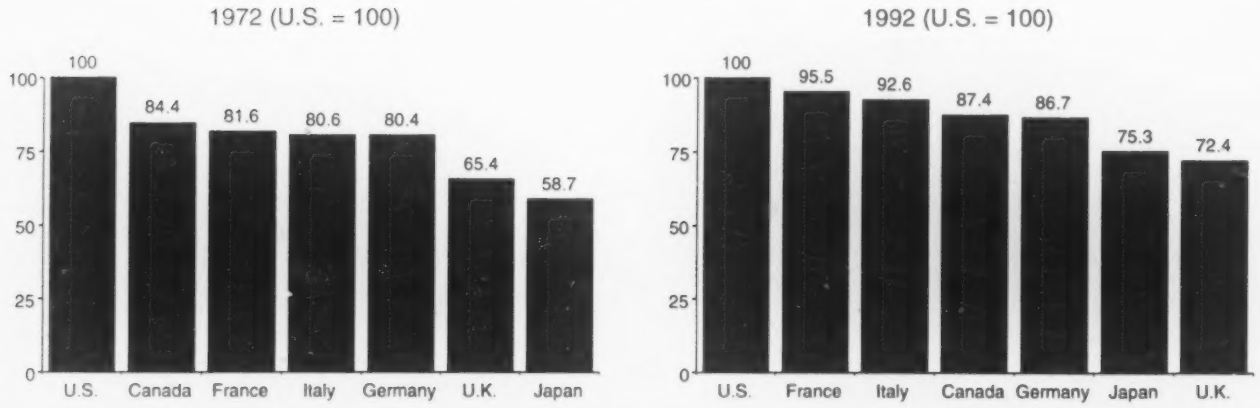
- **U.S. productivity dips in 1989.** In the most recent year for which U.S. data is available (1989), U.S. manufacturing productivity declined by 0.3 percent. The decade-end decline contrasts with the strong improvements in U.S. manufacturing productivity which occurred during the 1980s. See chart (top left) for latest year performance in other G-7 countries.

- **U.S. long-term productivity growth holds its own.** Aside from Japan and Italy, where productivity rose by 132 and 116 percent, respectively, since 1972, the United States has had stronger productivity growth than the rest of the G-7 countries. As the chart above (top right) illustrates, the 60 percent growth experienced in the United States since 1972 exceeds that of Germany and Canada by substantial margins.

  Some have argued that U.S. industry's strong manufacturing productivity gains of the 1980s can be attributed to plant closing and restructuring, particularly in the early 1980s. But, it also seems that U.S. industry has benefitted from a renewed commitment to quality and to more efficient ways of manufacturing.

MANUFACTURING PRODUCTIVITY

Manufacturing Productivity
in Purchasing Power Parities

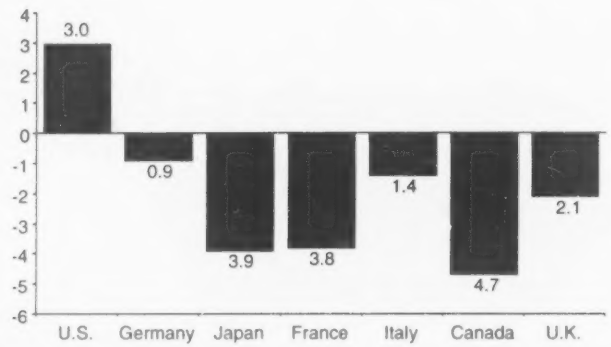


■ **U.S. still most productive, but gap closing.** Using PPPs, which adjust for different price levels in other countries relative to the United States, in 1972 the average American manufacturing worker was able to produce about 15 percent more goods than the next challenger, Canada, and about 40 percent more than Japan, the least productive G-7 economy in 1972. By 1992, the French worker was close on the heels of the U.S. worker in terms of manufacturing productivity, reaching 96 percent of U.S. levels. Even the least productive G-7 economy in 1992, the United Kingdom, was less than 30 percent below U.S. levels.

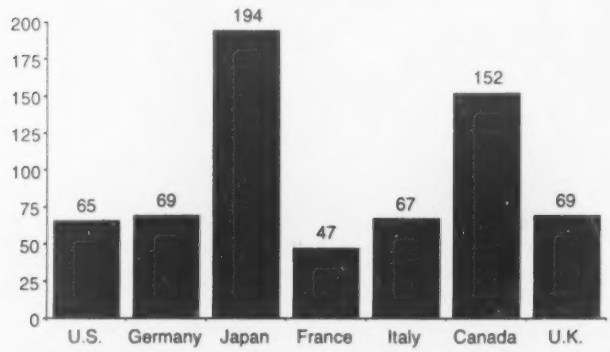
Manufacturing productivity is defined and measured as Gross Domestic Product per employee in the manufacturing sector.

INVESTMENT
Plant and Equipment

(1992)
Latest Year Percent of Growth
in Real Plant & Equipment Investment



(1972–1992)
Long-Term Percent of Growth
in Real Plant & Equipment Investment

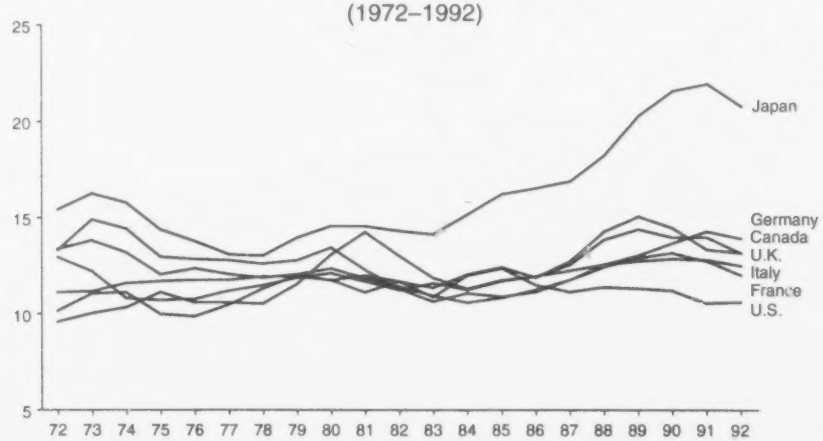


- **Investment in U.S. rises, plunges in other G-7.** Of all the G-7 countries, only the United States was able to increase its level of investment in plant and equipment in 1992. As the chart above left shows, U.S. real investment increased by just under 3 percent. In contrast, the 1992 global recession drove down investment by almost 4 percent in France and Japan, by almost 5 percent in Canada, and by somewhat smaller amounts in the United Kingdom, Italy, and Germany.

- **But, U.S. investment as a share of GDP still comes in last.** Despite positive investment performance in 1992, however, the United States invested a smaller share of GDP in plant and equipment than any other G-7 country for the sixth year in a row.

  As can be seen in the chart below, in 1992 U.S. investment in plant and equipment as a share of GDP was 10.6 percent, about half that of Japan's 20 percent. Germany invested about 14.5 percent of GDP on plant and equipment.

Investment in Plant & Equipment
as a Share of GDP
(1972–1992)



INVESTMENT
Plant and Equipment

- **Dollar-for-dollar comparisons.** Using current exchange rates, in 1992 the United States invested $548 billion in plant and equipment, compared with $673 billion in Japan. Japan's economy is about 60 percent the size of the U.S. economy. Using purchasing power parities to help adjust for price differences in plant and equipment in the G-7 countries, the United States comes out ahead in its investment effort, but here too, there is a trend of convergence over time.

- **U.S. long-term investment growth below par in G-7.** Over the past two decades, investment has grown more slowly in the United States than in any other G-7 country except France. The long-term growth chart on the previous page shows that by 1992, U.S. investment was only 65 percent higher in real terms than it was in 1972, whereas investment in Japan was almost 200 percent higher and 150 percent higher in Canada. U.S. investment growth was slightly weaker than in Germany and Britain (each with 69 percent) and Italy (67 percent), but markedly stronger than in France (47 percent).

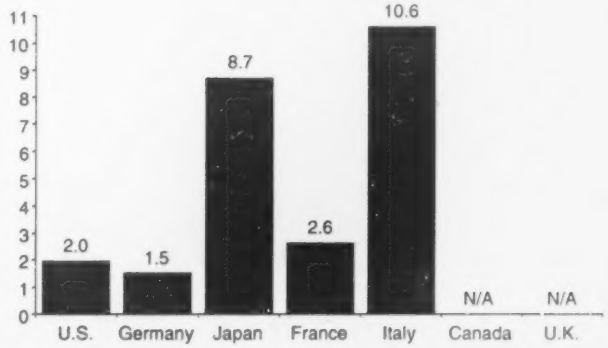
  In addition to slow growth in gross investment, net investment relative to GDP in the United States has actually been on a downward trend since the 1970s. This trend is not unique to the United States and can be partly explained by the decline in price of short-lived assets relative to longer-lived assets. Of all the G-7 countries, however, the decline in net investment is most pronounced in the United States and the United Kingdom. The jury is still out on the competitive impact of investing relatively more heavily in short-lived assets (e.g., computers and other information technology) than in long-lived assets (e.g., structures and industrial equipment).

- **U.S. net household savings up but still lowest of all G-7 countries.** The U.S. investment picture can be explained to some extent by looking at national household saving rates. U.S. households saved 4.9 percent of their disposable income in 1991, slightly up from the previous year, but well below that saved by all the other G-7 countries. In 1991, Japanese households saved 14.6 percent of disposable income and Germans saved 12.6 percent of theirs.

We measure investment in plant and equipment by determining its share of Gross Domestic Product.

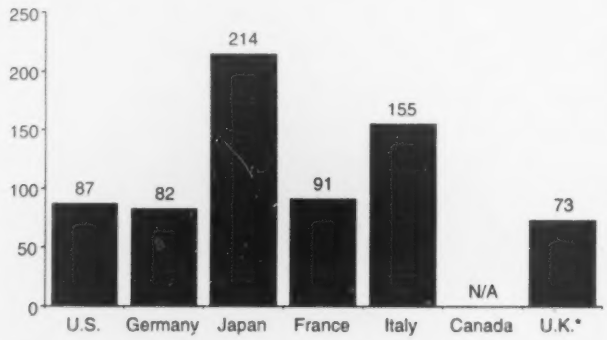
INVESTMENT
Civilian Research and Development

(1990)
Latest Year Percent of Growth
in Real Civilian R&D



N/A = not available

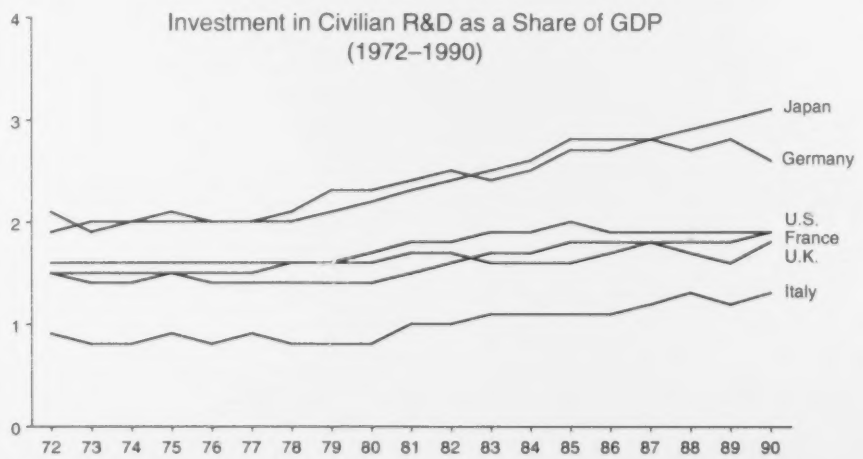
(1972–1990)
Long-Term Percent of Growth
in Real Civilian R&D



N/A = not available; *U.K. = 1989, latest year

- **Japan dwarfs U.S. R&D spending increase in 1990.** The chart above left shows that although the United States increased real spending on commercial R&D by almost 2 percent in 1990, the Japanese increased their spending by nearly 9 percent. Germany increased its spending on commercially relevant R&D by 1.5 percent in 1990.
- **Others have grown faster since 1972.** U.S. R&D spending has grown by about 87 percent in real terms since 1972. The chart above (top right) shows that France, Japan, and Italy have exceeded that rate of R&D growth by a wide margin. Germany's real spending on civilian R&D was slightly less than that of the United States, but as the reader will see below, Germany and Japan stand out for committing a much greater share of their GDP to civilian R&D than does the United States.
- **U.S. civilian R&D spending stays at 1.9 percent.** The chart below shows that U.S. spending on civilian R&D has remained virtually unchanged at 1.9 percent of GDP for most of the past decade. In 1990, Japanese spending on civilian R&D inched up to 3.1 percent of GDP. Relative spending in Germany declined from 2.8 to 2.6 percent of GDP in the same year.

Investment in Civilian R&D as a Share of GDP
(1972–1990)



*Data for Canada is not available.

INVESTMENT
Civilian Research and Development

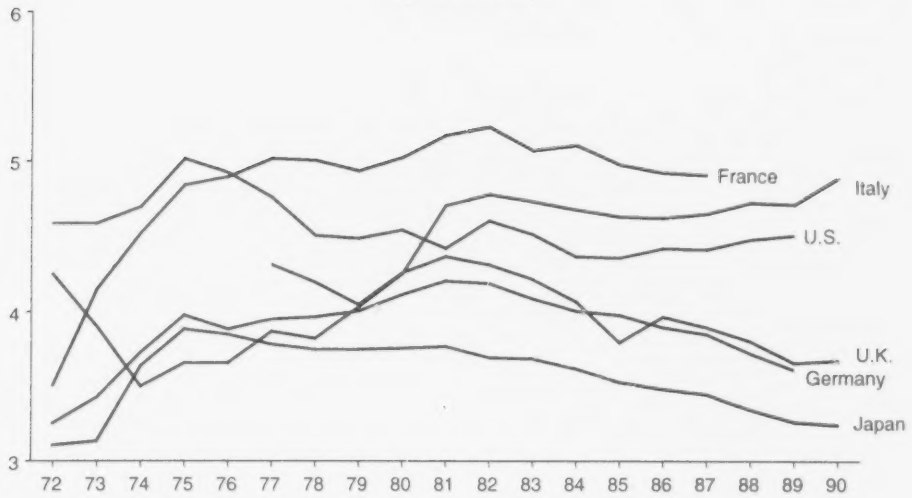
- In absolute dollar terms the United States still spends more than twice as many current dollars on civilian R&D than any other country because the U.S. economy is so much larger than any other economy. Nevertheless, the trendline suggests that Japan and Germany, in particular, recognize the importance of R&D investment to competitiveness and have increased their spending accordingly.

- **Although U.S. industry's share of R&D spending has grown relative to the government's, industry real spending is declining.** The National Science Foundation estimates that U.S. industry spending has actually declined by 0.3 percent in real terms from 1989 to 1991.

We measure investment in civilian R&D by determining its share of Gross Domestic Product.

INVESTMENT
Education

Public Expenditure on Education
as a Share of GDP
(1972–1990)



*Data for Canada is not available.

■ **Data shows U.S. as big spender.** International data on national public spending on education does not account for significant national differences in education systems and in reporting requirements. Nonetheless, certain long-term trends do emerge: the United States has tended to invest a relatively larger share of GDP on education than most other G-7 countries.

The chart above shows that U.S. public sector spending on education was 4.5 percent of GDP in 1989. Japan spent 3.2 percent of GDP and Germany 3.6 percent of GDP on education.

We measure investment in public education by determining its share of Gross Domestic Product.

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Council Executive Committee member Michael E. Porter (Professor, Harvard Business School) helped develop the initial framework for the *Index*. Council Associate Andrée C. Dumermuth produced this year's *Index*. The report was reviewed by Allen W. Shiau (Senior Vice-President, World Service, The WEFA Group); Dr. Shiau and C. Lanier Benkard (Associate Economist, The WEFA Group) also generated the data used in this report. Production work was done by Candy Rogers.

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Founded in 1986, the Council on Competitiveness is a nonprofit, nonpartisan organization of chief executives from industry, organized labor, and higher education who have one overriding objective — to improve the ability of American companies and workers to compete in world markets, while raising living standards at home. Among the Council's specific goals are to assist in the development of far-sighted government policies and private sector initiatives that help U.S. industry and workers compete; to promote consensus and cooperation on competitiveness-related issues within the private sector; and to increase public awareness of the linkages between America's competitiveness and its economic well-being.

The Council is governed by a 27-member Executive Committee and draws on the resources of its National Affiliates — 40 research organizations, professional societies, and trade associations — to help coordinate private sector activity. The Council is privately supported through contributions from its members, foundations, and other granting institutions.

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